

Date: Thursday, 9/20/2007 3:17:44 PM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : 412 X-TUBE ,LOW NARROW AFT	PROTOTYPE FOR ENGINEERING USE ONLY
Job Number : 34754	Part Number : D412664249	
Estimate Number : 13020	Drawing Number : D412-664-249 U/R	
P.O. Number :	Project Number : N/A	
This Issue : 9/20/2007 S.O. No. :	Drawing Revision : U/R	
Prsht Rev. : NC	Material :	
First Issue : / / Type : LANDING GEAR	Due Date : 9/27/2007	
Previous Run :	Qty: 2 Um: Each	
Written By : _____		
Checked & Approved By : _____		
Comment : Est Rev:A New Issue 07.09.12 EC verified by: JLM		

Additional Product

002006

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D212-664-247 CHG001

N/A 07.09.05

2.0 D6008132P

Crosstube extrusion



Comment: Qty.: 1.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6008132P Crosstube 26548 OR 25668
Check OD = 3.250", ID = 2.375" 3.50" x 2.25"CERTIFICATE OF CONFORMITY
REQUIRED

24 07/09/24

3.0 MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: 1-TURN AS PER FOLIO FA708 & DWG D412-664-249,

FOLIO REV: /

DWG REV: /

2-DEBURR AS REQUIRED

24 07/09/24

4.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

24 07/09/24

1000

1000

1000

1000

1000

1000

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Part Number: D412664249

Job Number:



Seq. #: Machine Or Operation: Description :

5.0

QC8

SECOND CHECK

**ENGINEERING
APPROVAL**



Comment: SECOND CHECK

07.09.05 (2)

6.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

JD 7-9-20 (2)

7.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

07.09.20 (2)

8.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

JD 7-9-21 (2)

9.0

QC3/5

INSPECT WORK/WING WALK



Comment: Inspect work & Chemical conversion Coat

QC3 H QC5 07.09.21

(2)

10.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D412-664-249 using CNC bender program and Folio FT

EL 7-9-20 (2)

11.0

QC6

DIMENSIONAL CHECK

**ENGINEERING
APPROVAL**



Comment: DIMENSIONAL CHECK

07.09.20 (2)

12.0

D36601

CUFF



Comment: Qty.: 2.0000 Each(s)/Unit Total : 4.0000 Each(s)

CUFF

Batch: 34716

JD 7-9-20

CERTIFICATE OF CONFORMITY
REQUIRED

(4)

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 412 X-TUBE ,LOW NARROW AFT

Job Number: 34754

Part Number: D412664249

Job Number:



Seq. #: Machine Or Operation: Description :

13.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill Rivet holes as per Dwg D412-664-249 .

2-Drill pilot holes in tube as per Dwg D412-664-249

3-Ream hole to finish size in tube as per Dwg D412-664-249

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-249

DP
7-9-20

14.0 HAND FINISHING1 HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat Tube & Cuffs as per QSI 005 4.1

DP/ 7-9-20

15.0 QC3 INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

7-9-20

16.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

ENGINEERING
APPROVAL

07.09.20

17.0 OUTSIDE SERV.10 OUTSIDE SERVICES LG



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 038

Issue P/O: _____ LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

CERTIFICATE OF CONFORMITY
REQUIRED

N/A 07.09.20

18.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

N/A 07.09.20

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Job Number: 34754

Part Number: D412664249

Job Number:



Seq. #: Machine Or Operation: Description :

19.0

QC5

INSPECT WORK TO CURRENT STEP



**ENGINEERING
APPROVAL**



Comment: Inspect for damage & ensure results are as per Dwg D412-664-203

N/A 07.09.20

20.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Rivet Cuffs as per Dwg D412-664-249. with Sika flex in Between tube & Cuff

A/R SIKAFLEX -241/-291 BATCH: M105469

DP/ 7-9-20

21.0

CR3212407

CHERRY RIVET



Comment: Qty.: 44.0000 Each(s)/Unit Total : 88.0000 Each(s)

CHERRY RIVET

Batch: M104071

DP/ 7-9-20

22.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

ml 07 09 21

2-Paint outside crosstube with White Imron as per QSI 005 4.2

N/A 07.09.21 CP

23.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

N/A 07.09.23

24.0

D28961

Support



**CERTIFICATE OF CONFORMITY
REQUIRED**



Comment: Qty.: 1.0000 Each(s)/Unit Total : 2.0000 Each(s)

Support

Batch: 30200 27 07 -09-23

Date: Thursday, 9/20/2007 3:17:44 PM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 412 X-TUBE ,LOW NARROW AFT

Job Number: 34754

Part Number: D412664249

Job Number:



Seq. #: Machine Or Operation: Description :

25.0

D31891

Chafing Shield



CERTIFICATE OF CONFORMITY
REQUIRED



Comment: Qty.: 2.0000 Each(s)/Unit Total : 4.0000 Each(s)

Chafing Shield

Batch: 33561

ml 07 09 21

26.0

D3595 063-570

Rubber Cushion (per sq ft)



Comment: Qty.: 0.0263 sf(s)/Unit Total : 0.0525 sf(s)

Rubber Cushion

Cut to .630" X 5.70" Qty 2

Batch: 53835

PT 07-09-23

CERTIFICATE OF CONFORMITY
REQUIRED

27.0

MS2192028

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 8.0000 Each(s)

Clamp

Batch: 107385

PT 07-09-23

28.0

MS2192030

clamp(per MIL-DTL-8783C)



Comment: Qty.: 2.0000 Each(s)/Unit Total : 4.0000 Each(s)

clamp(per MIL-DTL-8783C)

100154 PT 07-09-23

29.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Assemble as per Dwg D412-664-249

Instal support with magnobond 6398 per dwg D412-664-249,
cure for 12hrs before packaging.

Time & date of application: 10 200 07-09-23

Batch: 104723

PT 07-09-23

30.0

QC5

INSPECT WORK TO CURRENT STEP



ENGINEERING
APPROVAL



Comment: INSPECT WORK TO CURRENT STEP

PT 07-09-23

Date: Thursday, 9/20/2007 3:17:44 PM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 412 X-TUBE ,LOW NARROW AFT

Job Number: 34754

Part Number: D412664249

Job Number:



Seq. #:

Machine Or Operation:

Description :

31.0

PACKAGING 1

PACKAGING RESOURCE #1



FOR ENGINEERING USE ONLY



Comment: HAND FINISHING RESOURCE #1

Identify and pack for shipping as per ~~PPF D412 664 249~~

N/A CP 07.09.24

32.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

07.09.25

Job Completion



U 07.09.28

n/o 00206

PARTS LIST:

Qty	Part Number	Description
X	D412-664-249	CROSSTUBE ASSEMBLY (412 LOW AFT)
1	D6009-129	CROSSTUBE
2	D2856-600-1009	ABRASION STRIP
1	D2896-1	SUPPORT
2	D3189-1	CHAFING SHIELD
2	D3595-063-570	RUBBER CUSHION
2	D3660-1	CUFF
44	CR3212-4-07	RIVET (OR M7885/3-4-07)
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6009-129
FINISHED LENGTH = 107.82±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) ALL DIMENSIONS ARE IN INCHES.
- 5) PART IS SYMMETRIC ABOUT CENTERLINE.
- 6) WHEN MACHINING TAPER, RUN-OFF PART AT STOCK. BLEND OUT EDGE LONGITUDINALLY,
TRANSITION SHOULD BE SMOOTH.
- 7) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 8) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 9) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 10) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE PER QSI 035.
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 12) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE
D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE
CROSSTUBE SUPPORT.
- 14) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY
AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 16) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

PRELIMINARY ISSUE

07.07.26

A		07.07.07	NEW ISSUE
DESIGN	QP	DRAWN BY	QP
CHECKED		APPROVED	
DATE	07.07.07	TITLE	CROSSTUBE (412 LOW AFT)

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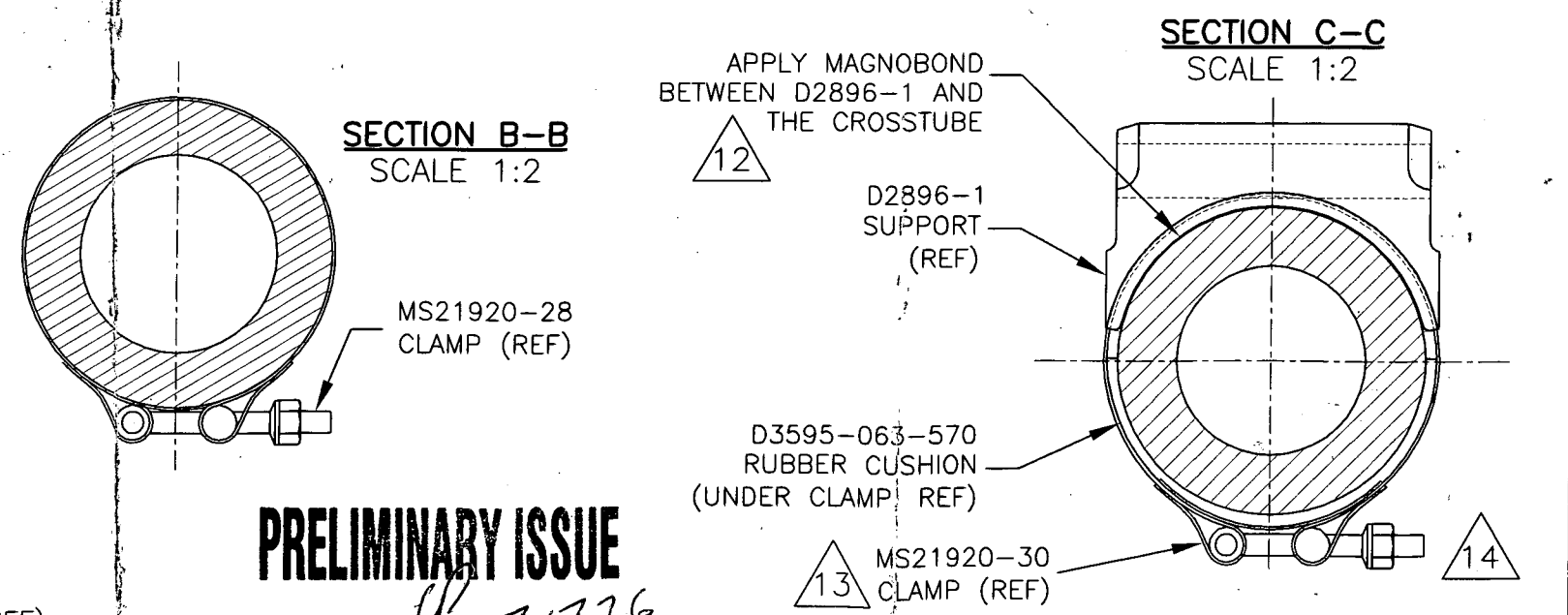
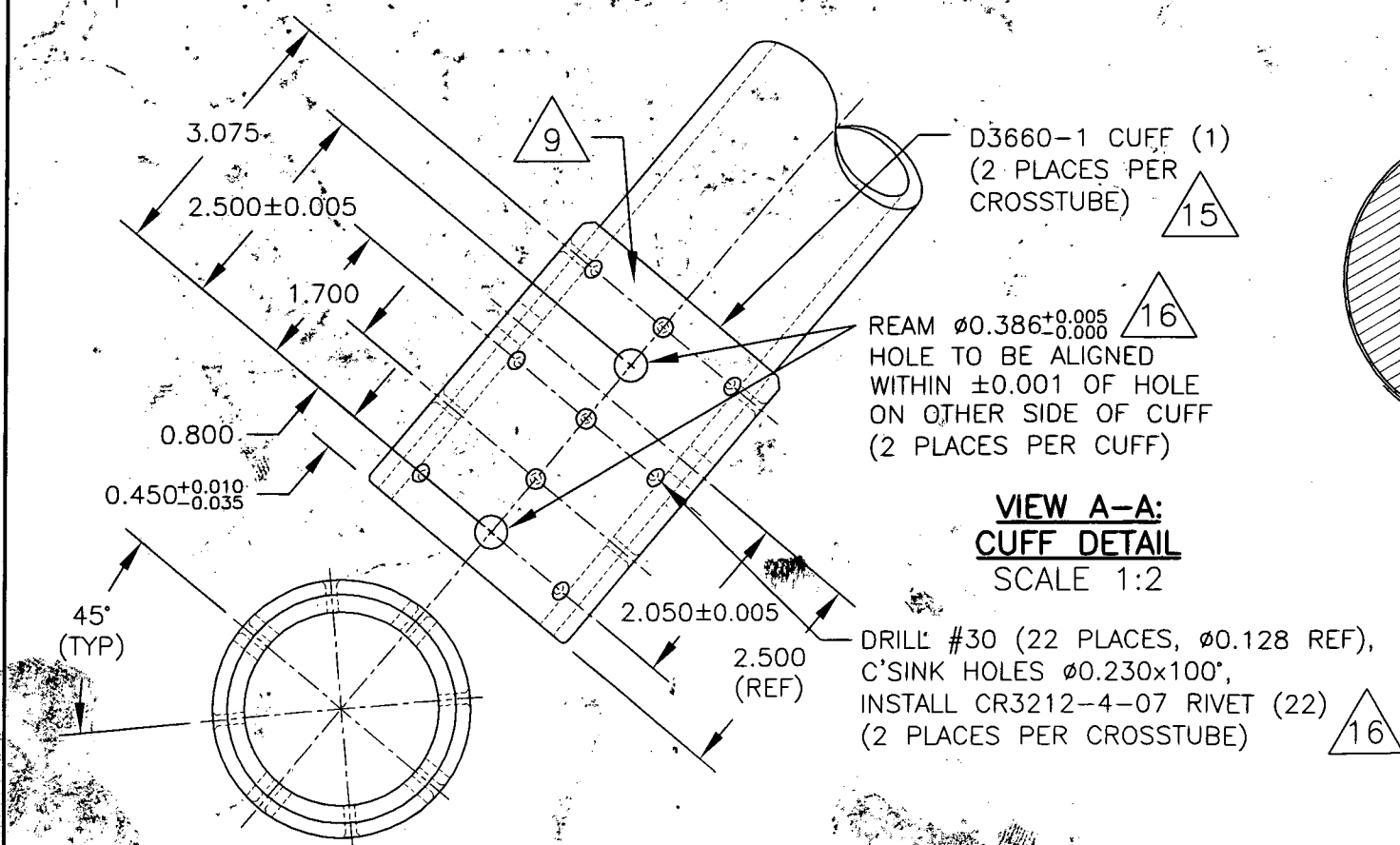
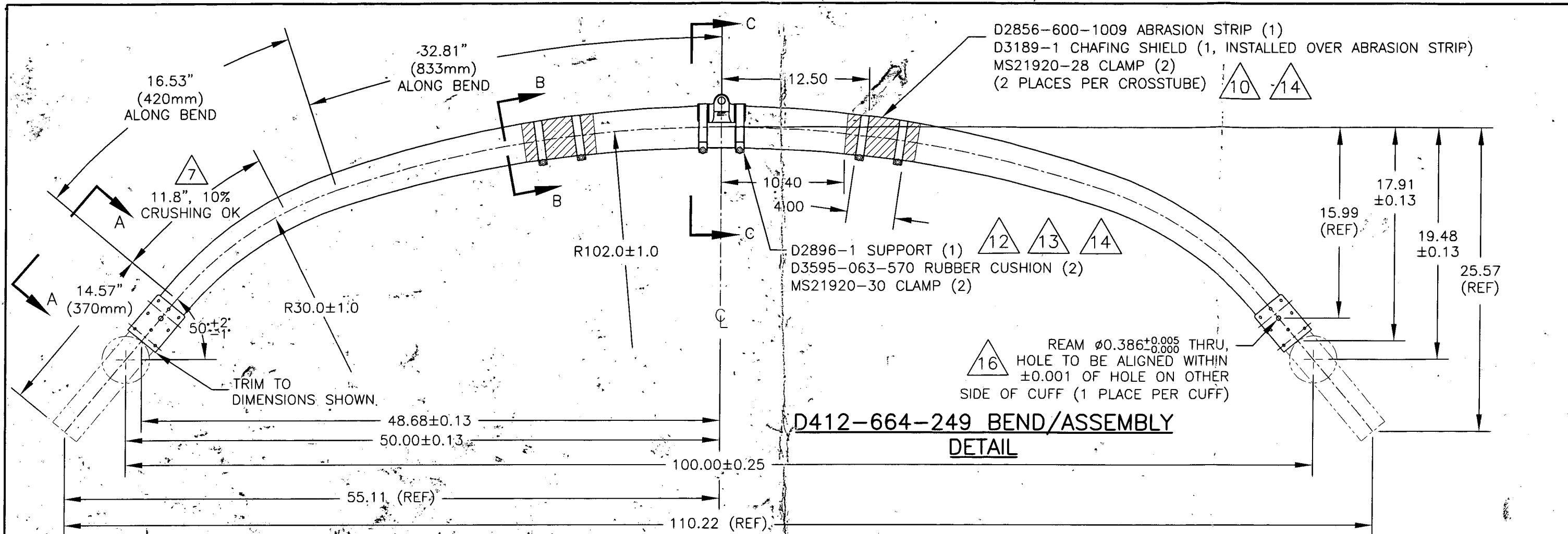
DART

DART AEROSPACE LTD.
HAWKESBURY, ONTARIO, CANADA

DRAWING NO.
D412-664-249

REV. A
SHEET 1 OF 3

SCALE
1:8

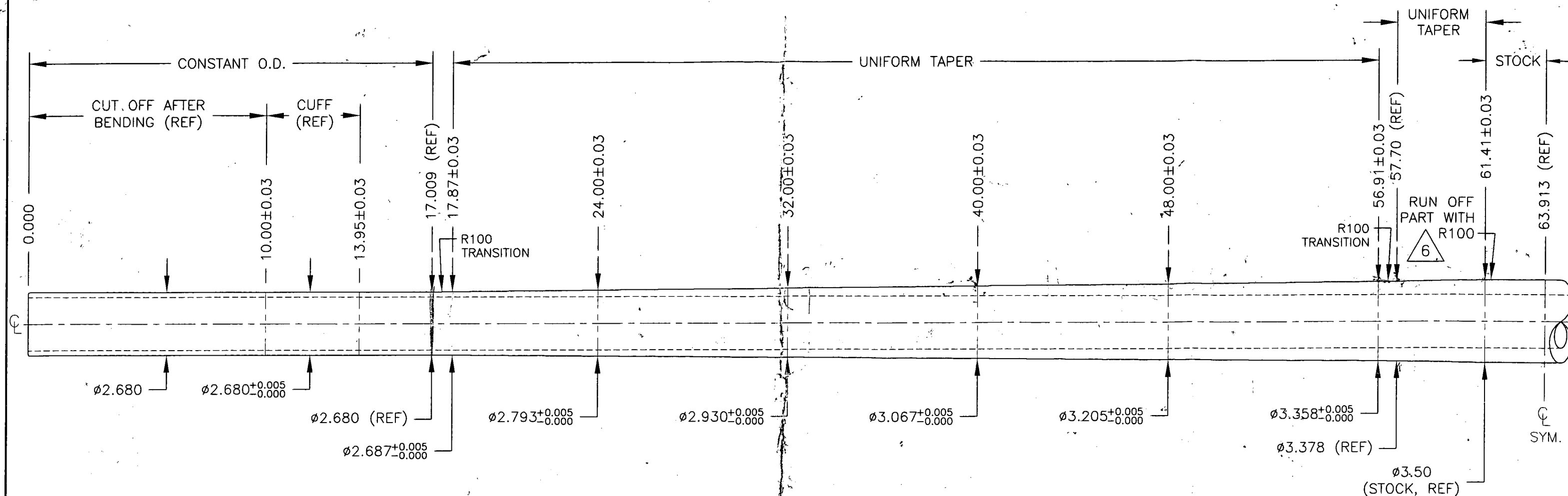


PRELIMINARY ISSUE

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DESIGN	q	DRAWN BY	q	DART	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED		APPROVED		DRAWING NO. D412-664-249	REV. A SHEET 2 OF 3
DATE	07.07.07	TITLE	CROSSTUBE (412 LOW AFT)	SCALE	1:8



D412-664-249 MACHINING DETAIL

PRELIMINARY ISSUE
07.07.26

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	CHECKED	APPROVED			DRAWING NO. D412-664-249	REV. A SHEET 3 OF 3
	DATE 07.07.07	TITLE CROSSTUBE (412 LOW AFT)			SCALE 1:4	

DART AEROSPACE LTD		Work Order: 00206
Description: Crosstube Assembly		Part Number: 34754 A
Inspection Dwg: D 412-664-249 Rev: A		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☒ Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	Ø 3,500"	± .030"	3.500	✓			
	Ø 3,378"	± .010"	3.378	✓			
	Ø 3,358"	± .005 - .000	3.362	✓			
	Ø 3,205"	± .005 - .000	3.209	✓			
	Ø 3,067"	± .005 - .000	3.071	✓			
	Ø 2,930"	± .005 - .000	2.934	✓			
	Ø 2,793"	± .005 - .000	2.797	✓			
	Ø 2,687"	± .005 - .000	2.681	✓			
	Ø 2,680"	± .010"	2.684	✓			
	Ø 2,680	± .005 - .000	2.684	✓			
SIDE B	127.826	± .020"	127.750	✓			
	Ø 3,500	± .030"	3.500				
	Ø 3,378"	± .010"	3.378				
	Ø 2,680"	± .010"	2.684				
	Ø 3,358"	± .005 - .000	3.362				
	Ø 3,205"	"	3.209				
	Ø 3,067"	"	3.071				
	Ø 2,930"	"	2.934				
	Ø 2,793"	"	2.797				
	Ø 2,687"	"	2.681				
	Ø 2,680"	"	2.684				
	127.826"	± .020"					

Measured by: J.F.	Audited by: J.F.	Prototype Approval: [Signature] N/A
Date: 07/09/05	Date: 07/09/06	Date: 07/09/06

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	

* COMPENSATE BY CUTTING OFF 9.96 ± 0.03 " AT EITHER END OF THE
TUBE, INSTEAD OF 10.00" A) PER DRAWING.

\$67.09.06

DART AEROSPACE LTD		Work Order: 00206
Description: Crosstube Assembly		Part Number: 34754 B 0412664249-2
Inspection Dwg: 0312664249 Rev: A		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☒ Prototype

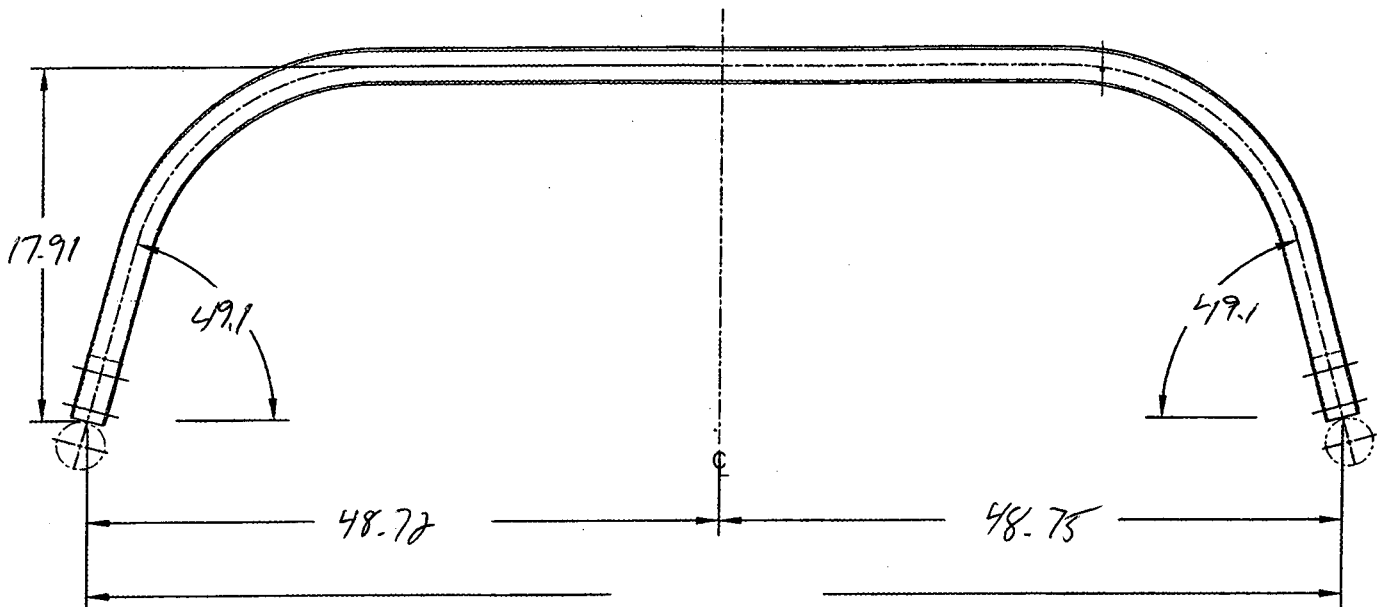
	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	3.500	$\pm .030$	3.500	✓			
	3.378	$\pm .010$	3.382	✓			
	3.358	$\pm .005$	3.362	✓			
	3.205	"	3.209	✓			
	3.067	"	3.071	✓			
	2.930	"	2.934	✓			
	2.793	"	2.797	✓			
	2.687	"	2.691	✓			
	2.680	$\pm .010$	2.685	✓			
	2.680	$\pm .005$	2.685	✓			
	2.680	$\pm .010$	2.685	✓			
	127.826	$\pm .020$	127.826	✓			
SIDE B	3.500	$\pm .030$	3.500				
	3.378	$\pm .010$	3.382				
	3.358	$\pm .005$	3.362				
	3.205	"	3.209				
	3.067	"	3.071				
	2.930	"	2.934				
	2.793	"	2.797				
	2.687	"	2.691				
	2.680	$\pm .010$	2.685				
	2.680	$\pm .005$	2.685				
	2.680	$\pm .010$	2.685				

Measured by: JLB	Audited by: [Signature]	Prototype Approval: [Signature] N/A
Date: 07/09/06	Date: 07-09-06	Date: 07-09-06

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	

DART AEROSPACE LTD		Work Order:	B00206-1
			34754 A
Description:		Part Number:	412-664-749
Inspection Dwg: D412-664-749 Rev: A Prelm. Issue			Page 1 of 1

Required Dimension	Min	Max
Height		
1/2 Span		
Angle		
Total Span		



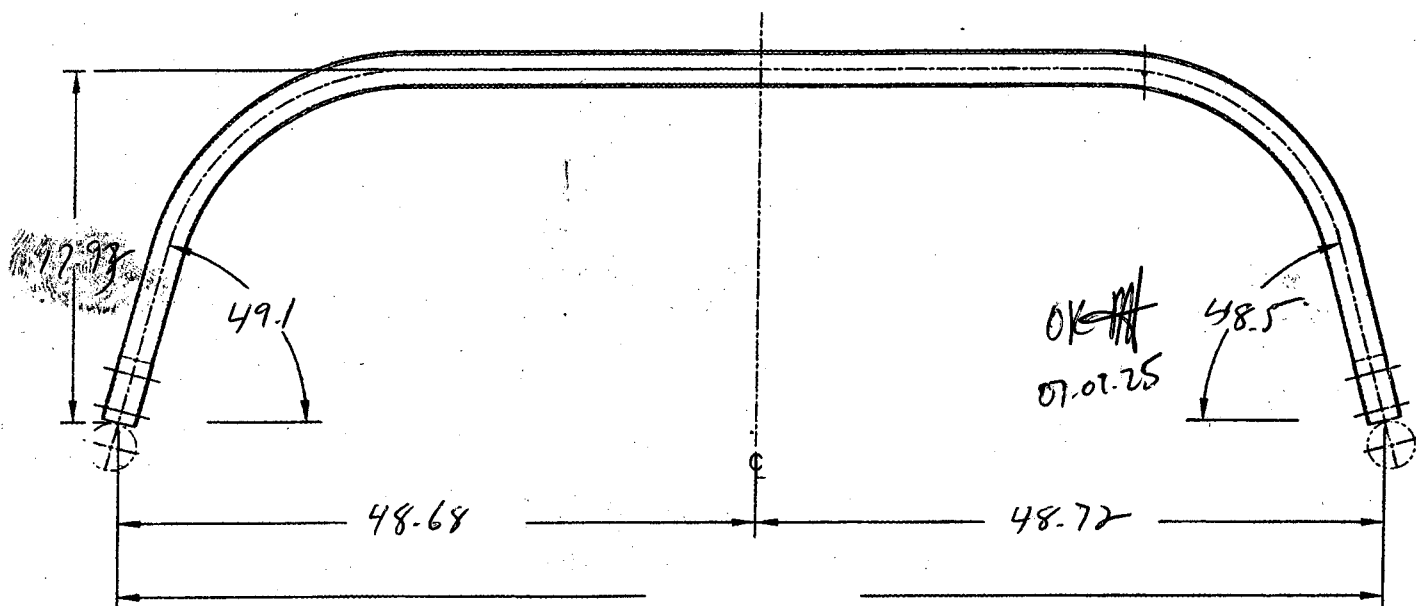
Comments

QC15 Inspection	<i>CP</i>
Date	07.09.20

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	

DART AEROSPACE LTD		Work Order: B00206-2
Description:		Part Number: 34754B
Inspection Dwg: D212-664-249 Rev: A Prelim Issue		Page 1 of 1

Required Dimension	Min	Max
Height		
1/2 Span		
Angle		
Total Span		



Comments

QC15 Inspection	CP
Date	07.09.20

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	

